

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Valerie J. Ryan, Chienkuo Konnie Yuan and Guy A. Crosby  
Application No.: 09/306,530 Group: 1617  
Filed: May 6, 1999 Examiner: S. Wang  
For: METHODS FOR LOWERING VISCOSITY OF GLUCOMANNAN  
COMPOSITIONS, USES AND COMPOSITIONS

<b>CERTIFICATE OF MAILING</b>	
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to Assistant Commissioner for Patents, P.O. Box 2327, Arlington, VA 22202	
on <u>4/24/02</u>	<u>Annie Demirel</u>
Date	Signature
<u>Annie Demirel</u>	
Typed or printed name of person signing certificate	

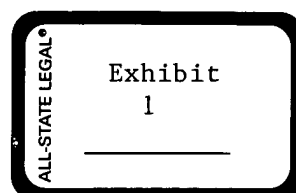
DECLARATION OF ARTHUR J. MCEVILY, PH.D.  
UNDER 37 C.F.R. § 1.132

Assistant Commissioner for Patents  
P.O. Box 2327  
Arlington, VA 22202

Sir:

I, Arthur J. McEvily, Ph.D., of 60 West Bare Hill Road, Harvard, MA 01451, declare and state that:

- I am providing this statement in my capacity as representative of Opta Food Ingredients, Inc., assignee of the entire right, title and interest of the above-identified application by



virtue of an assignment recorded in the United States Patent and Trademark Office assignment branch on August 11, 1999 at Reel 010157, Frames 0905-0908.

2. I received a Bachelor of Science degree in Biochemistry from Marlboro College in 1981 and a Doctor of Philosophy degree in Chemistry from the University of North Carolina at Chapel Hill in 1988. I was a postdoctoral fellow at Harvard Medical School, Center for Biochemical and Biophysical Sciences and Medicine.
3. I have been employed at Opta Food Ingredients, Inc. since 1988 in various capacities: Research Scientist (1988-89); Senior Research Scientist (1989-1992); Product Director (1992-1993); Director, Sales & Business Development (1993-1994); Vice President, Sales & Business Development (1994-1996); Vice President, Applications & Technical Service (1996-1997); Senior Vice President, Commercial Development (1997-1998); Executive Vice President (1998-2001). I am currently the President and CEO of Opta Food Ingredients, Inc. My Curriculum Vitae (CV) is attached hereto as Exhibit A.
4. As indicated in my CV, I am the author of numerous publications in the field of biochemistry, food formulation and product development. I am an inventor or co-inventor on several U.S. patents.
5. Prior to making this statement, I have reviewed the above-referenced patent application, and the Office Action mailed from the US PTO on January 24, 2002. The Examiner states that although the pending claims are enabled for certain viscosity lowering compounds (i.e., maltodextrin, hydrolyzed guar gum and inulin), the specification does not reasonably provide enablement for any other polysaccharide with a molecular weight of about 1,000 to 50,000 daltons which may be termed viscosity lowering compounds. The Examiner also states that a person of ordinary skill in the art would have been required to perform undue experimentation to identify viscosity lowering compounds

within the claimed scope. I respectfully disagree with the Examiner's conclusions for the reasons presented below.

6. The studies described in the above-referenced patent application and herein were carried out either under my supervision or by employees of Opta whose work I have carefully reviewed.
7. The above-referenced patent application discloses a composition comprising glucomannan and a viscosity lowering polysaccharide having a molecular weight from about 1,000 to about 50,000 daltons. The viscosity of the resulting glucomannan composition is lower in the presence of the polysaccharide than without the polysaccharide.
8. Since the filing of the above referenced-application, further studies have been conducted to show there are other functional polysaccharides falling within the about 1,000 to about 50,000 dalton molecular weight range that can be used to lower the viscosity of aqueous glucomannan solutions. The experiments are described below.

#### Methods

Over a one minute period, 5 grams of konjac flour were added to 420 ml distilled water with stirring at 550 rpm using an overhead mixer with shaft containing a three blade impeller. After stirring for an additional 60 seconds, the viscosity of the mixture was then measured for one minute, in the absence of stirring, with a viscometer (Brookfield, Spindle #4, 2 rpm, one minute reading after viscometer is started). The composition was again stirred at 550 rpm while 75 grams of a viscosity-lowering polysaccharide was added. Stirring was continued until the viscosity-lowering polysaccharide was completely dispersed. The viscosity of the mixture was measured again.

## Results

Initial Viscosity of the Aqueous Konjac Solution	Viscosity Lowering Polysaccharide	Mix Time, min.	Final Viscosity
3800 cP	Larch Gum	5	70 cP
3800 cP	Gum Arabic	25	300 cP
3600 cP	Benefiber	10	1,100 cP

Larch gum (also known as arabinogalactan), gum arabic and benefiber were tested for their ability to decrease the viscosity of aqueous konjac solutions. These three polysaccharides have a molecular weight in the range of about 1,000 to about 50,000 daltons. Each of the tested polysaccharides significantly decreased the viscosity of aqueous glucomannan solution.

9. Based upon these additional experiments, it is clear that there are not a vast number of polysaccharides in the target molecular weight range of about 1,000 to about 50,000 daltons. Our experiments illustrate a simple technique to assess which polysaccharides in this target range are viscosity lowering compounds. The methods involve creating a simple admixture and then measuring the change in viscosity after addition of the polysaccharide. These experiments do not require a great amount of time or effort. Together with the information in the Application describing the phenomenon of these viscosity lowering polysaccharides and a description of the procedure for creating the glucomannan-polysaccharide admixtures, any one of skill in the art can assess which polysaccharides will lower the viscosity of the aqueous solution. These further examples support the scope of the Claims and show that the observation of the viscosity lowering characteristics is not limited to those polysaccharides tested.

I declare that all statements made in this Declaration of my own knowledge are true and that all statements made on information and belief are believed to be true. Moreover, these

statements were made with the knowledge that willful false statements and the like made by me are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

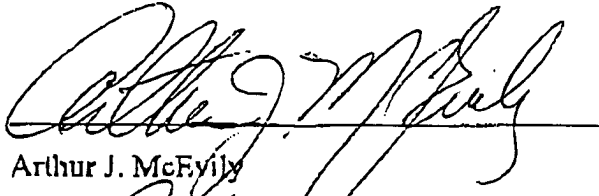
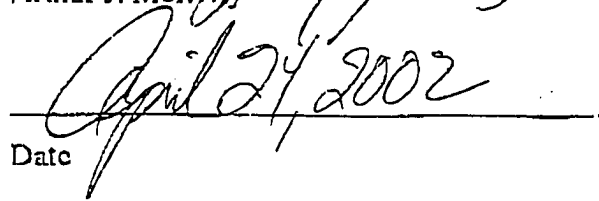
  
Arthur J. McFily  
  
Date

Exhibit A: Curriculum Vitae

## Curriculum Vitae

**Name:** Arthur J. McEvily, Ph. D.

**Home Address:** 62 West Bare Hill Road  
Harvard, MA 01451

**Date of Birth:** March 6, 1952

**Education:**

1977-78	Rutgers University Camden, NJ Major: Biology and Chemistry
1979-81	Marlboro College Marlboro, VT Major: Biochemistry Degree: Bachelor of Science; Graduated with Highest Honors
1981-85	University of North Carolina at Chapel Hill Chapel Hill, NC Department: Chemistry, Biological Division Degree: Ph. D.
1985-88	Harvard Medical School Center for Biochemical and Biophysical Sciences and Medicine - Dr. Bert Vallee, M. D., Director Boston, MA Postdoctoral Research Fellow in Protein Chemistry and Enzymology

**Employment:**

1988-Present	Opta Food Ingredients, Inc. (formerly Enzytech, Inc.) 25 Wiggins Avenue, Bedford MA
-1988-89	Research Scientist
-1989-92	Senior Research Scientist
-1992-93	Product Director
-1993-94	Director, Sales & Business Development
-1994-96	Vice President, Sales & Business Development
-1996-97	Vice President, Applications & Technical Service
-1997-98	Senior Vice President, Commercial Development
-1998- <sup>2000</sup> <del>Present</del>	Executive Vice President Director, Opta Food Ingredients - Europe Interim General Manager - Stabilized Products Division Interim General Manager - Canadian Harvest Division

- 2000 - Present President + CEO

EXHIBIT

A

**Teaching Experience:**

1980-81	Marlboro College, Teaching Assistant, Organic Chemistry Lab
1981-82	UNC Chapel Hill, Teaching Assistant, Quantitative Chemistry Lab

**Awards and Honors:**

Marlboro College	-Thomas E. Thompson Scholarship -Emma E. Curtis Scholarship -Windham Foundation Scholarship -Graduated with Highest Honors
UNC Chapel Hill	-National Science Foundation Graduate Research Fellowship -University Fellowship (Declined in order to accept NSF Fellowship) -Walter J. Johnson Prize (Awarded by the Editorial Committee of <i>Archives of Biochemistry and Biophysics</i> )

**Publications:**

- Mullinax T. R., Mock, J. N., McEvily, A. J., and Harrison J. H. (1982) Regulation of mitochondrial malate dehydrogenase: Evidence for an allosteric citrate binding site. *J. Biol. Chem.* 257:13233-13239.
- McEvily, A. J., Flint, A. J., and Harrison, J. H. (1985) Concomitant purification of three porcine heart mitochondrial enzymes: Citrate synthase, aspartate aminotransferase and malate dehydrogenase. *Anal. Biochem.* 144:159-164.
- McEvily, A. J., Mullinax, T. R., Dulin, D. R., and Harrison J. H. (1985) Regulation of mitochondrial malate dehydrogenase: Kinetic modulation independent of subunit interactions. *Arch. Biochem. Biophys.* 238:229-236.
- McEvily, A. J. and Harrison, J. H. (1985) Subunit equilibria of porcine heart citrate synthase: effects of substrate, pH and enzyme concentration. *J. Biol. Chem.* 261:2593-2598.
- McEvily, A. J., Holmquist, B., Auld, D. S., and Vallee, B. L. (1988) 3 $\beta$ -Hydroxy-5 $\beta$ -steroid dehydrogenase activity of human liver alcohol dehydrogenase is specific to  $\gamma$ -subunits. *Biochem.* 27:4284-4288.
- McEvily, A. J. and Vallee, B. L. (1990) HPLC Purification of human liver Class I alcohol dehydrogenase isozymes. *BioChromatog.* 5:13-17.
- McEvily, A. J., Iyengar, R., Gross, A. T. (1990) A new processing aid for the inhibition of shrimp melanosis. *Proc. Fifteenth Trop. Subtrop. Fish. Technol. Conf.*, Florida Sea Grant Report No. 105, pp. 147-153.

Otwell, W. S. and McEvily, A. J. (1990) Inhibiting melanosis in trawled and pond-reared shrimp species. *Proc. Fifteenth Trop. Subtrop. Fish. Technol. Conf.*, Florida Sea Grant Report No. 105, pp. 369-372.

Frankos, V. H., Schmitt, D. F., Haws, L. C., McEvily, A. J., Iyengar, R., Miller, S. A., Munro, I. C., Clydesdale, F. M., Forbes, A. L., and Sauer, R. M. (1991) Generally Recognized as Safe (GRAS) evaluation of 4-hexylresorcinol for use as a processing aid for prevention of melanosis in shrimp. *Regul. Toxicol. Pharmacol.* 14:202-212.

McEvily, A. J., Iyengar, R., and Otwell, W. S. (1991) Sulfite alternative prevents melanosis. *Food Technol.* 45:80 & 82-85.

Iyengar, R., Bohmont, C. W., and McEvily, A. J. (1991) 4-Hexylresorcinol and prevention of shrimp blackspot: Residual analyses. *J. Food Comp. Anal.* 4:148-157.

King, J. M., McEvily, A. J., and Iyengar, R. (1991) Liquid chromatographic determination of the processing aid 4-hexylresorcinol in shrimp. *J. Assoc. Off. Anal. Chem.* 74:1003-1005.

McEvily, A. J. and Zaks, A. (1991) Emulsifiers and Surfactants. In *Biotechnology and Food Ingredients*. Goldberg, I. and Williams, R., eds. Van Nostrand Reinhold. NY, NY. pp. 193-221.

Otwell, W. S., Iyengar, R., and McEvily, A. J. (1992) Inhibition of shrimp melanosis by 4-hexylresorcinol. *J. Aquatic Food Prod. Technol.* 1:53-65.

McEvily, A. J., Iyengar, R., and Gross, A. T. (1992) Inhibition of polyphenol oxidase by phenolic compounds. In *Phenolic Compounds and Their Effects on Health I: Analysis, Occurrence, and Chemistry*. Ho, C. -T., Lee, C. Y., and Huang, M. -T., eds. ACS Symposium Series# 506, American Chemical Society, Washington, DC.

McEvily, A. J., Iyengar, R., and Otwell, W. S. (1992) Inhibition of enzymatic browning in foods and beverages. *Crit. Rev. Food Sci. and Nutrit.* 32:253-273.

Iyengar, R. and McEvily, A. J. (1992) Anti-browning agents: alternatives to the use of sulfites in foods. *Trends in Food Sci. Technol.* 3:60-64.

#### Patents:

McEvily, A. J. (1991) Method of preventing browning in foods utilizing protease free latex extracts particularly from figs. *US Pat. No.* 4,981,708.

McEvily, A. J., Iyengar, R., and Gross, A. (1991) Compositions and methods for inhibiting browning in foods using resorcinol derivatives. *US Pat. No.* 5,059,438.

McEvily, A. J., Iyengar, R., and Gross, A. (1993) Compositions and methods for inhibiting browning in foods and beverages. *US Pat. Applic. No.* 07/712,794. All claims allowed.